State of Utah
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY

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December 22, 1993

Mr. Dave Hodson, Manager
Barneys Canyon Mine
P.O. Box 311
Bingham Canyon, UT 84006-0311

RE: Waste Rock Management Plan Ground Water Discharge Permit No. UGW350001

Dear Mr. Hodson:

We received the revised Environmental Compliance Manual and the Waste Rock Management plan as required by Part I, H 3 of the permit. Both submittals were timely. We responded to the Environmental Compliance Manual November 1, 1993. Our comments regarding the Waste Rock Management plan follow.

After thorough review and discussion in our office, we remain concerned that your waste rock management plan does not address the concerns described in our April 1, 1993 letter. A copy of the letter is enclosed. We reiterate our concerns in the following paragraph.

The weathering and oxidation of sulfide bearing rock (FeS_2) will result in an increase in sulfate and dissolved solids downgradient the mine sites as described in the following 2 equations.

1. $2FeS_2 + 2H_20 + 70_2 \rightarrow 2FeSO_4 + 2H_2SO_4$

2. $H_2SO_4 + CaCO_3 \rightarrow CaSO_4 + H_2CO_3$

The first equation describes the formation of acid (H_2SO_4) by the weathering of pyrite. The second equation describes the neutralization of the acid by reaction with limestone ($CaCO_3$). Your letter of January 28, 1993 and your most recent report suggest there are no problems because there is adequate limestone to neutralize all acid. You are correct in the assumption that all acid will be neutralized, but we are concerned about the sulfate compounds produced by the neutralization of the acid with the limestone in equation 2. Reaction of acid with limestone will produce gypsum ($CaSO_4$) and the reaction of acid with dolomite will produce gypsum and epsom

salts (Mg_2SO_4). Both compounds are soluble. It is these compounds which form a leachate which contaminates ground water. Because the site is a major recharge area for the Salt Lake Valley, precaution must be taken to protect water quality downgradient the site. This aspect of the problem was not discussed or considered in your submittal.

We believe it is appropriate that Barneys Canyon either submit a satisfactory model showing (1) the increase in TDS from oxidation and weathering of sulfide waste rock at the downgradient monitoring wells, and (2) the expected increase in sulfate at the monitoring wells; or provide satisfactory answers, plans and a discussion for the five questions in our April 1, 1993 letter. We request a reply within 30 days as to which route Barneys Canyon will take.

Should you wish to meet regarding the problem or have any other questions, please call Mack Croft at 538-6146.

Sincerely,

Don A. Ostler, P.E.
Director

Enclosure

DAO:MC:gt

cc: Division of Oil, Gas & Mining ✓
SL City/County Health Dept.

P:WASTEROCK.LTR
FILE:BARNEYS CANYON